

REMARKS

Claims 55, 57-59, 61, 63, 65, 66, 71, 73, 76-77, 79 and 82 are amended; claims 1-54, 56, 67, and 68 are cancelled; and claims 84-86 are added herein. Claims 73-81 are presently withdrawn from consideration. Therefore, claims 55, 57-66, 69-72, and 82-86 are currently pending and under consideration in this application. The amendments to the claims are fully supported by the original claims and specification. No new matter has been added by the amendments made herein. Entry of the amendments at this time is therefore respectfully requested.

I. Claim Objections

Claims 63 and 82 were objected to for use of an improper article. Claims 63 and 82 have been amended and are now in proper form. Claims 66-69 were also objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 66 is amended to resolve the objection and claims 67-68 are cancelled. Claim 69 is already in proper dependent form as the claims further limits the subject matter of the previous claim.

As such, Applicant respectfully requests withdrawal of the Examiner's objections to the presently pending claims.

II. 35 U.S.C. § 112, 1st paragraph, Written Description

Claims 55-72 and 82-83 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for the reasons set forth on pages 3-4 of the Office Action. Applicant respectfully traverses.

The Examiner is respectfully reminded that there is a strong presumption that an adequate written description of the claimed invention is present when the application is filed and the PTO has the initial burden of presenting evidence or reasons why person skilled in the art would not recognize in the disclosure a description of the invention defined by the claim. *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976) and MPEP § 2163. The Examiner has not met its initial burden in the present case. "The 'essential goal' of the description of the invention requirement is to clearly convey the information that an applicant has invented the subject matter which is claimed." *In re Barker*, 559 F.2d 588, 592 n.4, 194 USPQ 470, 473 n.4 (CCPA 1977);

see MPEP 2163 (I). In other words, "[t]o satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention." *See, e.g.,* Moba, B.V. v. Diamond Automation, Inc., 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); Vas-Cath, Inc. v. Mahurkar, 935 F.2d at 1563, 19 USPQ2d at 1116. MPEP § 2163(1).

Applicant has amended the claims herein. The present claims are now specifically directed to a cultivated watermelon variety producing fruit with an average fructose content of at least 60% or an average sucrose content of at least 65% of total soluble sugar; and/or an average combined fructose and sucrose content of at least 90% of the total soluble sugar.

Applicant has provided a clear and full description of the claimed watermelon plants and methods of producing. Applicant provides examples of the claimed watermelons having elevated sugar content; provides reproducible methods of measuring the elevated sugar content; provides reproducible methods of producing the claimed watermelons. *See, for example,* Tables 2 and 3 of the instant specification. More specifically, *see for instance,* Plant lines 705-5 and 706-1 having at least 60% fructose content; Plant lines 742-6, 770-7, 335(1-6), 340-(1-6) having at least 70% sucrose content; and Plant lines 742-6, 770.7, 334-(1-6); 335-(1-6) having a combined fructose and sucrose content of at least 90% of total soluble sugar. Applicant also clearly sets forth and teaches how the plants were obtained by crossing a wild type *Citrus* species with *Citrus lanatus* to produce F₁ hybrid seeds. Thus, Applicant has demonstrated possession of numerous plants with the claimed characteristics and also the method of production.

In this manner, having "describe[ed] the claimed invention with all of its limitations using such descriptive means as words, . . . that fully set forth the claimed invention", Applicant has reasonably shown possession of the pending claims. *Lockwood, v. American Airlines, Inc.* 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997)." MPEP § 2163.

Based on the foregoing, Applicant respectfully submits that it has provided a representative species and identifying characteristics sufficient to provide written description of the presently pending claims. Accordingly, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C 112, written description.

III. 35 U.S.C. § 112, 1st paragraph, Enablement

Claims 55-72 and 82-83 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement for the reasons set forth on pages 5-6 of the Office Action.

The test of enablement is whether the "disclosure coupled with information known in the art provides sufficient information to one reasonably skilled in the art to make or use the invention without undue experimentation." *United States v. Telectronics, Inc.*, 857 F.2d 778, 785, (Fed. Cir. 1988). Reasonable and routine experimentation is not undue experimentation. In fact, even if the experimentation is complex it does not necessarily make it undue, if the art typically engages in such experimentation. *Massachusetts Institute of Technology v. A.B. Fortia*, 774 F.2d 1104 (Fed. Cir. 1985). It is common in plant breeding to require a significant amount of routine experimentation, including back crosses and selection steps. These steps, while labor intensive, are not undue experimentation.

There are many factors to be considered when determining whether any necessary experimentation is "undue." These factors include, but are not limited to: the breadth of the claims; the nature of the invention; the state of the prior art; the level of one of ordinary skill; the level of predictability in the art; the amount of direction provided by the inventor; the existence of working examples; and the quantity of experimentation needed to make or use the invention based on the content of the disclosure. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988) (reversing the PTO's determination that claims directed to methods for detection of hepatitis B surface antigens did not satisfy the enablement requirement). It is improper to conclude that a disclosure is not enabling based on only one of the above factors. MPEP § 2164.01 (a).

Breadth of Claims

The present claims have been amended herein. The amended claims are now specifically directed to a watermelon plant producing fruit with an average fructose content of at least 60% or an average sucrose content of at least 65% of total soluble sugar; and/or an average combined fructose and sucrose content of at least 90% of the total soluble sugar.

Nature of the Invention

The procedures used in Applicant's presently claimed invention are well known in the plant breeding art. The techniques have been used for years and while some plant breeding

techniques are tedious and require multiple applications, they are proven and predictable techniques used by skilled plant breeders.

State of the Prior Art

At the time of filing the individual breeding techniques used in the invention were well known. For example, the steps of hybridizing, selecting plants, and measuring soluble sugar content were well known. Applicant has provided watermelon with elevated levels of soluble sugars and surprisingly discovered that watermelon plants could be produced having fruit with unexpectedly elevated soluble sugars by crossing a wild type *Citrulus species* with a *Citrulus lanatus* to produce F₁ hybrid seeds; growing plants from the F₁ seeds and pollinating the F₁ plants; collecting the hybrid seeds produced by the F₁ plants; growing plants from the seeds produced by the F₁ plants; measuring the total soluble sugar content of ripe fruit produced from the plants grown from the seeds of the F₁ plants; and selecting plants with watermelon fruit comprising an average fructose content of at least 60% or sucrose content of at least 65%; and/or fructose and sucrose content of least 90% of the total soluble sugar.

While, it was not known at the time of filing that watermelon plants could be produced with such elevated soluble sugar content, the plant breeding techniques were known. Thus, one skilled in the art at the time of filing, with Applicant's disclosure, would be able to perform each of the steps taught by Applicant to obtain the claimed watermelon plants.

Level of One of Ordinary Skill in the Art

The level of skill of a person of ordinary skill in the art of plant breeding is relatively high. As explained above, a skilled plant breeder at the time of filing, having Applicant's disclosure of the invention in hand, would be able to produce the claimed watermelon plants having the specific characteristics using routine plant breeding techniques.

Level of Predictability in the Art

The procedures used in Applicant's presently claimed invention are well known in the art. The techniques have been used for years and while some are tedious and require multiple applications at time, they are proven and predictable techniques used by skilled plant breeders. For examples, the specific steps of crossing; collecting the hybrid seeds; growing the hybrid seeds and collecting the fruit; measuring the total soluble sugar content of ripe fruit; and selecting plants are well known and predictable to a plant breeder.

Amount of Direction Provided

The specification provides working examples and methods related to the claimed invention, including sampling methods for the selection steps required. For instance, Examples 1-4 provides details of each of the steps and examples of progeny produced. The disclosure clearly sets forth information on the claimed watermelon plants and its specific characteristics. In addition, Applicant also provides methods for obtaining the claimed watermelon plants by crossing a wild type *Citrulus* species with *Citrulus lanatus* to produce F₁ hybrid seeds. This is followed by pollinating the F₁ plants; collecting the hybrid seeds produced by the F₁ plants; growing the plants from the seeds produced by the F₁ plants; measuring the total soluble sugar content of ripe fruit produced from the plants grown from the seeds of the F₁ plants; and selecting plants with watermelon fruit comprising an average fructose content of at least 60% or sucrose content of at least 65%; and/or fructose and sucrose content of least 90% of the total soluble sugar.

Working examples

Applicant provides several working examples of the claimed invention as shown in Tables 2 and 3 of the instant specification for example. More specifically, see Plant lines 705-5 and 706-1 having at least 60% fructose content; Plant lines 742-6, 770-7, 335(1-6), 340-(1-6) having at least 70% sucrose content; and Plant lines 742-6, 770.7, 334-(1-6); 335-(1-6) having a combined fructose and sucrose content of at least 90% of total soluble sugar. Applicant also clearly sets forth and teaches how the plants were obtained by crossing a wild type *Citrulus* species with *Citrulus lanatus* to produce F₁ hybrid seeds. Followed by pollinating the F₁ plants; collecting the hybrid seeds produced by the F₁ plants; growing the plants from the seeds produced by the F₁ plants; measuring the total soluble sugar content of ripe fruit produced from the plants grown from the seeds of the F₁ plants; and selecting plants with watermelon fruit comprising an average fructose content of at least 60% or sucrose content of at least 65%; and/or fructose and sucrose content of least 90% of the total soluble sugar. Thus, Applicant has demonstrated possession of numerous plants with the claimed characteristics and the method of production.

In view of the foregoing, Applicant respectfully submits that ordinarily skilled artisans would be able to make and use the claimed invention following the teaching disclosed in the application, without undue experimentation. (MPEP § 2164.01) Applicant further submits that

this conclusion is buttressed by the amount of knowledge in the state of the art as well as the predictability of the art, as well as the majority of Wands factors that weigh in favor of enablement. Therefore, the present application adequately enables the claimed invention.

Applicant thus respectfully requests favorable reconsideration and withdrawal of the rejection under 35 U.S.C. § 112.

IV. 35 U.S.C. § 112, 2nd paragraph, Indefiniteness

Claims 55-72 and 82-83 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention for the reasons set forth on pages 6-7 of the Office Action.

The legal standard for indefiniteness under 35 U.S.C. § 112, second paragraph, is whether a claim reasonably apprises those of skill in the art of its scope. *See, Amgen Inc. v. Chugai Pharm. CO.*, 927 F.2d 1200, 1217, 18 USPQ2d 1016, 1030 (Fed. Cir. 1991). "The definiteness inquiry focuses on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the rest of the specification." *Union Pacific Resources Co. v. Chesapeake Energy Corp.*, 236 F.3d 684, 692 (Fed. Cir. 2001).

The Examiner asserts that claims 56-57 were indefinite in their recitation of "average fructose content", claim 58 was indefinite in its recitation of "average sucrose content", and claim 59 was indefinite in its recitation of "average...content of fructose and sucrose". Applicant respectfully emphasizes that one skilled in the art (a plant breeder) would understand the scope of the claim when the claim is read in light of the rest of the specification. At paragraph [0063] of the published application, it specifically states:

it is understood that the sugar profile of the watermelon varieties . . . represents the average amount of any specific sugar within a fruit crop produced by these varieties. . . . Thus, as used herein . . . an average fructose content, . . . for example, represent[s] the mean plus or minus standard deviation of the fructose content measured for a ripe watermelon crop obtained by stress free cultivation, at its peak sugar production.

Furthermore, the specification also provides standard sampling parameters. The specification specifically states that the "average sugar content refers to an average measured in samples collected from the middle part of a cut fruit (2-4 cm from the center)." Thus, it is clear from the specification that the ripe watermelon crop is obtained by stress free cultivation at its

peak sugar production and that the sample is collected and measured from the center of the watermelon. Based on the above, one skilled in the art of plant breeding would understand the scope of the claim when the claim is read in light of the rest of the specification. Thus, these claim terms are definite.

Claim 70 was also rejected as being indefinite. The Examiner asserts that, "[c]laim 70 is indefinite because many of the members of the Markush group are not tissue types, but rather are plant parts, and hence do not further define 'tissue'." Claim 70 reads as follows:

The tissue culture according to claim 65, comprising cells or protoplasts from a tissue selected from the group consisting of leaves, pollen, ovules embryos, roots, root tips, anthers, flowers, fruit and seeds.

Applicant respectfully points out that claim 70 does, in fact, further define the term "tissue". For example, it further defines that tissue as plant tissue from leaves, pollen, ovules, embryos, roots, root tips, anthers, flower, fruit or seeds. It is well known what these different tissues are.

In view of the above, Applicant respectfully requests that the indefiniteness rejections be withdrawn, as the terms would be understood by the skilled artisan in view of the specification.

V. 35 U.S.C. § 102, Novelty

Claims 55-56, 62-65 and 72 were rejected under 35 U.S.C. 102(b) as being anticipated by Elmstrom et al. (1981, Amer. Soc. Hort. Sci. 160:330-333) for the reasons set forth on page 7 of the Office Action.

Applicant has amended the claims herein. The present claims are now specifically directed to a cultivated watermelon variety producing fruit with an average fructose content of at least 60% or an average sucrose content of at least 65% of total soluble sugar; and/or an average combined fructose and sucrose content of at least 90% of the total soluble sugar.

Elmstrom does not teach watermelon plants producing fruit with these elevated sugar contents. Thus, Elmstrom cannot anticipate the presently pending claims. Applicant therefore respectfully requests that this rejection be withdrawn.

VI. 35 U.S.C. § 103, Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of skill in the art, to modify the reference or to combine art reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Moreover, "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l. Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007) quoting *In re Kahn* 441 F.3d 977, 988 (Fed. Cir. 2006); see MPEP §§2143.01 and 2143.03.

A. Elmstrom

Claims 55-65 and 72 were rejected under 35 U.S.C. 103(a) as being unpatentable over Elmstrom et al. for the reasons set forth on pages 7-8 of the Office Action.

Applicant thanks the Examiner for the acknowledgment that Elmstrom does not teach "watermelon lines in which the average fructose content is up to 60% of the total soluble sugar or in which the average sucrose content is up to 75% of the total soluble sugar or in which the total sucrose and fructose content is up to 95% of the total soluble sugar." The Examiner, however, asserts that it would have been obvious to one skilled in the art to breed for watermelon lines with these characteristics. The Examiner states that "[o]ne of ordinary skill in the art would have been motivated to do so because Elmstrom et al. teach the importance of selecting watermelon lines for high fructose levels to get sweeter fruit". Applicant respectfully traverses.

First, even if one skilled in the art were motivated to obtain elevated sugar contents, they would not have a reasonable expectation of succeeding in obtaining them. Elmstrom was published in 1981, over a quarter century ago. During this time no one ever produced the claimed watermelon plants having the elevated soluble sugar contents. Applicant was the first.

In addition, the Applicant surprisingly discovered the method of obtaining the claimed watermelon that produce fruit having the elevated sugar content. Prior to Applicant's teachings, one skilled in the art would not been motivated to use a wild type *Citrulus* species in order to obtain fruit with these higher sugar contents. The wild type *Citrulus* species is bitter and is not

known for its sweetness. Furthermore, one skilled in the art would not be able to obtain the claimed watermelon plants simply by hybridizing the cultivated varieties, as none possess the claimed characteristics or necessary genetic variability surprisingly still found in the wild type species.

Thus, without Applicant's teachings one skilled in the art would not have been motivated to cross a wild type *Citrus* species with a *Citrus lanatus* to produce F₁ hybrid seeds. Further, without Applicant's disclosure, one would not grow the plants from the F₁ seeds; pollinate the F₁ plants; collect the hybrid seeds produced by the F₁ plants; grow the plants from the seeds produced by the F₁ plants; measure the total soluble sugar content of ripe fruit produced from the plants grown from the seeds of the F₁ plants; and select plants with watermelon fruit comprising an average fructose content of at least 60% or sucrose content of at least 65%; and/or fructose and sucrose content of at least 90% of the total soluble sugar.

Furthermore, as stated above, without Applicant's teachings, there also would not have been a reasonable expectation of success, as watermelons producing fruit with such elevated soluble sugar content had never been produced, even after publication of Elmstrom over 25 years ago.

In sum, Elmstrom fails to disclose or suggest the invention as presently claimed and does not provide a reasonable expectation of success to obtain the claimed plants. Furthermore, Elmstrom fails to teach or enable one skilled in the art to produce the claimed invention. Applicant was the first to develop watermelon having the claimed characteristics and provide method to produce such claimed watermelon.

B. Elmstrom in view of Robinson

Claims 66-68 and 82-83 were rejected under 35 U.S.C. 103(a) as being unpatentable over Elmstrom et al. as applied to claims 55-65 and 72 above, and further in view of Robinson et al. (1999, J. New Seeds 1:1-47) for the reasons set forth on pages 8-9 of the Office Action.

Robinson does nothing to remedy the deficiencies of Elmstrom. Robinson does not teach the claimed watermelon plants with elevated soluble sugars or methods of obtaining such. Thus, like Elmstrom, Robinson does not make obvious the presently claimed invention for the same reasons stated above.

C. Elmstrom in view of Zhong

Claims 66-71 were rejected under 35 U.S.C. 103(a) as being unpatentable over Elmstrom et al. as applied to claims 55-65 and 72 above, and further in view of Zhong et al. (2002, US 2002/0073445) for the reasons set forth on page 10 of the Office Action.

Zhong also does nothing to remedy the deficiencies of Elmstrom. Zhong fails to teach the claimed watermelon plants with elevated soluble sugars and also fails to teach methods of obtaining such. Thus, like Elmstrom, Zhong does not make obvious the presently claimed invention for the same reasons stated above.

As none of the references cited above teach or suggest the presently claimed invention, provide a reasonable expectation of success, or provide methods of obtaining such, they therefore cannot make it obvious, alone or in combination. Thus, based on the foregoing, Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. 103(a) and allowance of the pending claims.

CONCLUSION

In view of the above, each of the presently pending claims is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding objections and rejections and pass this application to issue. If there are any questions, the Examiner is invited to call Applicant's representative Rodney Fuller at (602) 916-5404 to resolve any remaining issues to expedite the allowance of this application.

Respectfully submitted,

August 19, 2009
Date

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